

Commonwealth of Kentucky
Division for Air Quality
PERMIT STATEMENT OF BASIS

TITLE V PROPOSED PERMIT NO. V-05-042
SUN CHEMICAL CORPORATION, WURLAND FACILITY
WURLAND, KY.
OCTOBER 20, 2005
REVIEWED BY: KENVIRONS, INC.
SOURCE I.D. #: 021-089-00032
SOURCE A.I. #: 1604
ACTIVITY #: APE2004001

SOURCE DESCRIPTION:

Sun Chemical Corporation, Wurland Facility operates an existing facility to manufacture pigment feedstock under permit number V-99-010. Urea, Phthalic Anhydride and Cuprous Chloride are reacted in a solvent in six batch reactors. After the reaction cycle is completed, material is decanted, washed, filter pressed and dried.

Ammonia is produced as a byproduct of the reaction. Reaction solvent is lost during the drying process. A condenser and carbon bed adsorber are used to recover solvent. Ammonia and solvent emissions are controlled by a low NO_x afterburner system (Noxidizer).

DAQ acknowledges receipt on April 13, 2004, of a renewal Title V air quality permit application for the Sun Chemical Corporation, Wurland facility. This represents the first renewal of the Title V air permit. The permit history is summarized as follows:

Rev #	Permit Type	Log #	Complete Date	Issuance Date	Summary of Action
----	Initial Issuance	F800	12/23/98	9/30/99	-----
1	Significant Revision	51548	12/5/00	4/3/01	Increase annual production limit from 6600 tpy to 8000 tpy
2	Significant Revision	55749 55349 & 53161	7/1/03	11/07/03	Increase annual production limit from 8000 tpy to 11000 tpy, and updated permit template
3	Renewal Application	56485	4/13/04	---	Removal of Sulfonated Blue Production line from permit, installation of storage tanks T-62, T-46, and M-8, and the installation of Hammermill HM-1

The renewal Title V application was deemed complete on June 11, 2004 (60 days after receiving requested material).

The facility was issued Permit No. V-99-010 on September 30, 1999. The facility is classified as a Title V major source of air pollution, based on potential to emit more than 10 tpy of a single HAP for both 1,2,4-trichlorobenzene and HCl, and more than 25 tpy of a combination of HAP's. Sun Chemical is also a Synthetic minor source for SO₂ emissions and is a minor source for all other pollutants for 401 KAR 51:017 (PSD) purposes.

Sun Chemical Corporation, Wurtland Facility has applied for renewal of the initial Title V permit incorporating minor modifications to the facility. Sun Chemical was permitted to commence a proposed Sulfonated Blue production. The Sulfonated Blue was never produced nor was necessary equipment constructed. Sun Chemical has requested the removal of the Sulfonated Blue product line from the renewal permit. The incorporation of existing storage tanks T-200, T-62, T-46, and M-8 was submitted as a minor modification. T-200 has a 9,200 gallon capacity and is used to store and recycle dilute solvent. T-62 is a backup tank to T-71 and is used for wastewater storage. T-46 will also store wastewater and impurities from the product. Tank M-8 will be used to add coagulant to the wastewater pretreatment system. The addition of Hammermill, HM-1 was also incorporated into the renewal permit. T-62, T-46, M-8, and HM-1 do not increase emissions from the facility. The emissions of trichlorobenzene, estimated by EPA Tanks 4.0, from solvent storage tank T-200 are less than 0.01 tpy.

Applicable Regulations: The source is major for Title V (1,2,4-trichlorobenzene) and a synthetic minor for SO₂ emission and minor for all other pollutants for 401 KAR 51:017 (PSD) purposes.

The following is a list of significant emission units:

- EP (01) Utilities – Boilers, consists of two 20.92 mmBtu/hr boilers (B-1 and B-2), two 13.32 mmBtu/hr thermal fluid heaters (HO-1 and HO-2), and one 10.0 mmBtu/hr Noxidizer with Waste Heat Recovery (WHB).
- EP (2) Storage Tanks, consists of several storage tanks. Only two sources are regulated for the storage of volatile organic liquids, specifically the 14,366 gallon solvent storage tanks T-75 and T-80.
- EP (3) Production, consists of six glass lined reactors, and multiple process tanks, vacuum pumps, rotary dryers, filter presses, blenders, and a product pack-out station.
- EP (4) Wastewater Pretreatment Process, consists of several wastewater collection and processing vessels.
- EP (5) Urea Bulk Handling System, consists of urea bulk handling system BH-4 utilizing fabric filters for control of particulate emissions.
- EP (6) Pipeline Equipment in Heavy Liquid Service, consists of pipeline equipment in heavy liquid service subject to equipment leak standards.

The source is subject to:

1. Regulation 401 KAR 59:015 *New indirect heat exchangers*
2. 40 CFR 60 Subpart Dc as adopted by Regulation 401 KAR 60:043; *Standards of performance for small industrial-commercial-institutional steam generating units.*
3. Regulation 401 KAR 59:010 *New process operations*
4. Regulation 401 KAR 63:021 *Existing sources emitting toxic air pollutants.*
5. Regulation 40 CFR 63 Subpart FFFF, *National Emissions Standards for Hazardous Air Pollutants: Miscellaneous Organic Chemical Manufacturing.* [Subject to a compliance date of November 10, 2006.]
6. Regulation 40 CFR 63 Subpart DDDDD, *National Emissions Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers and Process Heaters.*

Applicable requirements specific to each emission unit are listed as follows:

EP (01) Units B-1, B-2, HO-1, HO-2, and WHB:

- a. 401 KAR 59:015 *New Indirect Heat Exchangers Constructed On or After April 9, 1972* applies to particulate, sulfur dioxide, and visible emissions from all indirect heat exchangers located at this source. Compliance assurance with particulate and opacity limits is met by combusting only fuels listed in the permit. Compliance assurance with sulfur dioxide limits maybe demonstrated by fuel sampling and testing by the permittee or certification by supplier.
- b. 40 CFR 63 Subpart DDDDD, *National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers and Process Heaters* applies to all boilers and the Noxidizer.
 - i. In accordance with 63.7506(b)(1), B-1, B-2, HO-1, and HO-2 are subject to only the initial notification requirements in 40 CFR63.9(b) (*i.e.*, they are not subject to the emission limits, work practice standards, performance testing, monitoring, SSMP, site-specific monitoring plans, recordkeeping and reporting requirements of this subpart or any other requirements in subpart A of this part).
 - ii. In accordance with 40 CFR63.7506(c)(3), WHB is not subject to the initial notification requirements in 40 CFR63.9(b) and is not subject to any requirements in this subpart or in subpart A of Part 63 (*i.e.*, emission limits, work practice standards, performance testing, monitoring, SSM plans, site-specific monitoring plans, recordkeeping and reporting requirements of this subpart, or any other requirements in subpart A of Part 63).
- c. The source has elected to accept a limit on SO₂ emissions to preclude 401 KAR 51:017, *Prevention of Significant Deterioration of Air Quality.*

EP(01) Units B-1, B-2, HO-1, and HO-2 Only:

- a. 40 CFR 60 Subpart Dc, *Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units* applies to Boilers B-1 and B-2, and Fluid Heaters HO-1 and HO-2, with fuel oil sulfur content limited in accordance with 40 CFR60.40c(d) shall not exceed 0.5 percent by weight, and visible emission limited to less than 20% opacity. Compliance assurance with the opacity limit is met by combusting only fuels listed in the permit. Compliance

assurance with sulfur dioxide limits maybe demonstrated by fuel sampling and testing by the permittee or certification by supplier.

EP (2) Storage Tanks T-75, T-80, and T-200:

- a. 40 CFR 63 Subpart FFFF, *National Emission Standards for Hazardous Air Pollutants: Miscellaneous Organic Chemical Manufacturing* was promulgated in November 2003. Emission Point (2) consists of several storage tanks, however only T-75, T-80, and T-200 are subject to 40 CFR 63 Subpart FFFF due to the storage of trichlorobenzene solvent. T-200 has a maximum capacity of less than 10,000 gallons, T-75 and T-80 have a maximum capacity of greater than 10,000 gallons but maintain a vapor pressure less than 1.0 psia (52 mmHg or 6.9 kPa) therefore T-75, T-80, and T-200 are designated as Group 2 Storage Tanks under Subpart FFFF of Part 63. Compliance assurance with 1,2,4-trichlorobenzene (TCB) emissions is in the form of recordkeeping. Records shall show the vapor pressure of T-75 and T-80 is less than 1.0 psia and records shall be maintained for the life of the tanks. [Subject to a compliance date of November 10, 2006.]
- b. 401 KAR 63:021 *Existing sources emitting toxic air pollutants* applies to the emissions of toxic air pollutants from T-75 and T-80. Compliance shall be demonstrated by maintaining a weekly log of the presence of a water head on tanks T-75 and T-80.

EP (3) Production:

- a. 401 KAR 59:010, *New Process Operations* applies to units under Emission Point (3) that have the potential for visible emissions and to emit particulate matter. PM emissions are limited in accordance with 401 KAR 59:010 Section 3(2), and visible emissions limited to less than 20% opacity. Control equipment consists of Pulse Jet Fabric Filters equipped with a particulate detection system. Compliance assurance with particulate emissions is met by monitoring process weight and hours of operation, and calculating PM emissions. Compliance assurance with opacity limits is demonstrated by normal operation of the fabric filter, the particulate detections system must automatically shut down the dust collection blower and wet cake dryer in the instance of particulate pass-through.
- b. 40 CFR 63 Subpart FFFF, *National Emission Standards for Hazardous Air Pollutants: Miscellaneous Organic Chemical Manufacturing* applies to the units under Emission Point (3) that have the potential to emit TCB. Sun Chemical Corporation will seek to preclude applicability of Subpart FFFF emission limitations, work practice standards, monitoring, recordkeeping, and reporting requirements specific to this emission unit by maintaining undiluted and uncontrolled emission stream HAP concentration below 50 ppmv. Please refer to COMMENTS (g). [Subject to a compliance date of November 10, 2006.]

EP (4) Wastewater Pretreatment Process:

- a. 40 CFR 63 Subpart FFFF, *National Emission Standards for Hazardous Air Pollutants: Miscellaneous Organic Chemical Manufacturing* applies to wastewater streams and wastewater pretreatment equipment that have the potential to emit TCB. Sun Chemical has determined that the wastewater streams

do not meet the criteria of a Group 1 Wastewater Stream. To preclude EP (4) from the requirements of a Group 1 Wastewater Stream, the following demonstrations shall be performed on an annual basis; 1) The total annual average concentration shall be determined according to appropriate procedures specified in 40 CFR 63.144(b)(1) and (3) through (6) of Subpart G, also 2) the annual average flow rate shall be determined according to procedures specified in 40 CFR 63.144(c) of Subpart G. Alternative methods for the determination of concentration and flow rate are specified in 40 CFR 63.2485(h)(1) through (3). [Subject to a compliance date of November 10, 2006.]

- b. 401 KAR 63:021 Existing Sources Emitting Toxic Air Pollutants applies to the emissions of ammonia. All ammonia emissions from the wastewater collection/Stripper Tank (T-72) shall be vented to the waste heat boiler.

EP (5) Urea Bulk Handling System:

- a. 401 KAR 59:010, *New Process Operations* applies to this source, with PM emissions limited in accordance with 401 KAR 59:010 Section 3(2), and visible emissions limited to less than 20% opacity. Control equipment consists of Fabric Filters. Compliance assurance with particulate emissions is met by monitoring process weight and hours of operation, and calculating PM emissions. Compliance assurance with opacity limits is demonstrated by normal operation of the fabric filter. During periods of filter malfunction Sun Chemical shall maintain records of qualitative visual observations as required in the permit.

SP (6) Pipeline Equipment in Heavy Liquid Service:

- a. 40 CFR 63 Subpart FFFF applies to equipment leaks from pipeline equipment. For compliance with equipment leak standards, 40 CFR 63.2480 states that the facility must comply with 40 CFR 63 Subpart TT or 40 CFR 63 Subpart UU or 40 CFR 65 Subpart F. Subpart UU was included in the permit since there is specific language for batch process equipment. Compliance shall be demonstrated with the implementation of a leak detection and repair (LDAR) program and the recordkeeping and reporting requirements required by Subpart UU and Subpart FFFF. [Subject to a compliance date of November 10, 2006.]

Non-Applicable Regulations:

a. Emission Unit 01 Utilities - Boilers

- i. 40 CFR 60 Subpart D, Standards of Performance for Fossil-Fuel-Fired Steam Generators for Which Construction was Commenced After August 17, 1971. Boiler 21A has a capacity of 7.3 mmBTU per hour, this is less than the minimum applicable capacity of 250 mmBTU per hour fossil fuel fired generators.
- ii. 40 CFR 60 Subpart Da, Standards of Performance for Electric Utility Generators for Which Construction was Commenced After September 18, 1978. Boiler 21A is not used in the capacity of generating electricity.

- iii. 40 CFR 60 Subpart Db, Standards of Performance for Industrial-Commercial-Institutional Steam Generating Units. Boiler 21A has a capacity of 7.3 mmBTU per hour, which is less than the minimum applicable capacity of 100 mmBTU per hour.
 - iv. 40 CFR 64 Compliance Assurance Monitoring (CAM). Not applicable since no control devices are employed to meet an applicable emission limit.
- b. Emission Unit 02 - Storage Tanks
- i. 40 CFR 60 Subpart K, Standards of Performance for Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels) for Which Construction, Reconstruction, or Modification Commenced After June 11, 1973 and Before May 19, 1978. No storage tanks at Sun Chemical were commenced during this period.
 - ii. 40 CFR 60 Subpart Ka, Standards of Performance for Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels) for Which Construction, Reconstruction, or Modification Commenced After May 18, 1978 and Before July 23, 1984. No storage tanks at Sun Chemical containing volatile organic liquids were commenced during this period.
 - iii. 40 CFR 60 Subpart Kb, Standards of Performance for Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels) for Which Construction, Reconstruction, or Modification Commenced After July 23, 1984. The volatile liquid storage tanks T-75 and T-80 are both 14,366 gallons, affected facilities are those with a capacity of greater than or equal to 75 cubic meters or 19,813 gallons. Therefore Subpart Kb does not apply.
 - iv. 401 KAR 59:050, New storage vessels for petroleum liquids. No petroleum liquids are in storage at Sun Chemical.
 - v. 40 CFR 64 Compliance Assurance Monitoring (CAM). Not applicable since no control devices are employed to meet an applicable emission limit.
- c. Emission Unit 03 - Production
- i. 40 CFR 60 Subpart RRR, Standards of Performance for Volatile Organic Compound Emissions from Synthetic Organic Chemical Manufacturing Industry (SOCMI) Reactor Processes. The reactors are exempt from Regulation 40 CFR 60 Subpart RRR since they are part of a process unit that does not produce any of the chemicals listed under those regulations.
 - ii. 40 CFR 60 Subpart Kb, The tanks included in this emission unit are exempt from Regulation 40 CFR 60 Subpart Kb as there are no volatile organic liquids being stored.

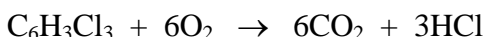
- iii. 40 CFR 64 Compliance Assurance Monitoring (CAM). CAM requirements do not apply to Emission Unit 03 in accordance with the exemption under 40 CFR 64.2(b)(1)(vi). A continuous compliance determination method required to demonstrate compliance with the HAP (TCB) emission limitation set forth in Sun Chemical's Title V Permit.
- d. Emission Unit 05 – Pipeline Equipment
 - i. 40 CFR 60 Subpart VV, Standards of Performance for Equipment Leaks of VOC in the Synthetic Organic Chemical Manufacturing Industry. The process lines are exempt from Regulation 40 CFR 60 Subpart VV since they are part of a process unit that does not produce any of the chemicals listed under those regulations.
 - ii. 40 CFR 64 Compliance Assurance Monitoring (CAM). Not applicable since no control devices are employed to meet an applicable emission limit.

COMMENTS:

- a. *Emission Factors:* Emission factors for small combustion devices and material handling equipment are based on AP-42. Emissions factors from the fugitive sources and Noxidizer are based on compliance testing.
- b. *Compliance Periods:* HAP/VOC compliance is based on an averaging period of three hours.
- c. As of November 10, 2003 Sun Chemical is subject to 40 CFR 63 Subpart FFFF. Sun Chemical is not required to comply with this subpart until November 10, 2006, with a Precompliance Report due at least 6 months before this date, and a Notification of Compliance Status Report due no later than 150 days after the compliance date.
- d. For compliance with equipment leak standards, 40 CFR63.2480 states that the facility must comply with 40 CFR 63 Subpart TT or 40 CFR 63 Subpart UU or 40 CFR 65 Subpart F. Subpart UU was included in the permit since there is specific language for batch process equipment. [*Subject to a compliance date of November 10, 2006.*]
- e. For wastewater emission standards, except as specified in 40 CFR 63.2485(b) through (l), the facility shall comply with 40 CFR63.132 through 40 CFR63.148 of Subpart G. [*Subject to a compliance date of November 10, 2006.*]
- f. Sun Chemical has determined that the storage tanks and wastewater are Group 2 emission units. It will be necessary for the facility to periodically demonstrate that the storage tanks and wastewater are operating within the Group 2 parameters as specified in Subpart FFFF. [*Subject to a compliance date of November 10, 2006.*]
- g. Sun Chemical's operations are described as "batch" operations, therefore any process vent from which emissions flow would be considered batch process vents. According to 40 CFR 63.2550(i) "*batch process vent*", there are a number of circumstances that could exclude Sun Chemical's process vents from this definition. More specifically 40 CFR 63.2550(i), under "*batch process vent*" (8) emission streams from emission episodes that are undiluted and

uncontrolled containing a HAP concentration of less than 50 ppmv or 200 lb/year is not a batch process vent for the purpose of Subpart FFFF.

Due to the wet and ammonia-laden gas stream prior to the Noxidizer, accurate measurement of TCB for demonstration of compliance with the “*batch process vent*” threshold under 40 CFR 63.2550(i) “*batch process vents*” (8) is not possible. Since TCB is oxidized to form HCl by the Noxidizer, compliance with the batch process vent threshold precluding applicability of Subpart FFFF for the EP 03 is assured through limiting the HCl concentration at the outlet of the control system. As shown below, three moles of HCl are formed for every mole of TCB oxidized:



Since 1 mole of each gas at standard conditions occupies the same volume, the volume of HCl created by the oxidation of TCB is 3 times the volume of the TCB prior to oxidation. Therefore, compliance with the 50 ppmv batch exempt status threshold for TCB can be assured by limiting HCl emissions at the outlet of the control system to less than $3 \times 50 \text{ ppmv} = 150 \text{ ppmv}$. Permit V-99-010 (Revision 2) already contains monitoring, recordkeeping, and reporting requirements sufficient to assure that the HCl concentration is below 150 ppmv. As such, the only new permit requirement pursuant to Subpart FFFF for EP 03 is the limit on HCl concentration to qualify for batch exempt status under 40 CFR 63.2550(i) “*batch process vents*” (8). [Subject to a compliance date of November 10, 2006.]

EMISSION AND OPERATING CAPS DESCRIPTION:

The Division has determined that the source has the potential to exceed the PSD major source thresholds. This was an issue of public concern and comment when the original construction permit was issued. In response to public comments and a public hearing, several production “limitations” were included in the construction permit that were brought forward into the Title V permit.

The following operating limitation is included in permit number V-05-042 under Production, Emission Point (3) in Section B. Pursuant to 401 KAR 63:021 and Agreed Order #DAQ-17972-114, the production rate of Copper Phthalocyanine Crude Blue shall not exceed 11,000 tons/year for any consecutive twelve months.

Sun Chemical Corporation, Wurtland Facility is a PSD minor source because of potential emissions from the combustion of fuel oil in the burner systems. The source is not currently burning fuel oil. Sun Chemical is also classified as a Synthetic Minor Source for SO₂, electing to limit emissions to preclude PSD applicability. As such, sourcewide emissions of SO₂ are limited to a maximum of 90 tons per year based upon a 12-month rolling average.

PERIODIC MONITORING:

PM/PM10

For small fabric filters for process units, monitoring is to consist of a weekly check and log of pressure drops. For the large pulsejet that controls the dryers, blenders and production equipment, continuous monitoring is done on the inlet temperature and pressure drop across the

baghouse. In addition, there is a “break through” monitor on the baghouse that indicates bag failure.

NO_x

There are no add-on controls for NO_x, but the Noxidizer is monitored to assure destruction of Ammonia and that excessive NO_x is not being formed. For this the first stage combustion temperature and O₂ outlet concentration are monitored.

HAPs (1,2,4-Trichlorobenzene, HCl and PCB)

The Noxidizer and carbon bed adsorber controls process Trichlorobenzene emissions. The following are monitored: the inlet and outlet temperatures of the adsorption system, pressure drop across the carbon adsorption system, first stage combustion temperature of the ammonia thermal oxidation system, O₂ outlet concentration of the ammonia thermal oxidation system and HCl outlet concentration of the ammonia thermal oxidation system.

Dioxin

Dioxin is formed as a by-product of combustion. To minimize formation, combustion temperature and HCl outlet concentration of the ammonia thermal oxidation system is being monitored. The source will also be subject to periodic testing.

As of November 10, 2003 Sun Chemical is subject to 40 CFR 63 Subpart FFFF. Sun Chemical is not required to comply with this subpart until November 10, 2006. The following periodic monitoring will apply at the compliance date.

- a. Group 2 Storage Tanks are those that are below 10,000 gallon capacity and/or has a maximum true vapor pressure of total HAP is less than 6.9 kilopascals. The true vapor pressure for storage tanks T-75 and T-80 shall be monitored.
- b. Group 2 Wastewater Streams are those that do not meet the criteria for Group 1 Wastewater Streams as specified in 40 CFR 63.2485(c)(1) through (3). The annual average concentration of compounds listed in Table 8 and 9 of 63 Subpart FFFF shall be monitored as well as the annual average flow rate of the stream.
- c. Equipment Leaks shall be monitored and repaired as specified in 63 Subpart UU for equipment in heavy liquid service.
- d. HCl shall be monitored at the Noxidizer outlet to assure the batch exempt status defined under 40 CFR 63.2550(i) “*batch process vents*” (8) is being maintained.

CREDIBLE EVIDENCE:

This permit contains provisions which require that specific test methods, monitoring or recordkeeping be used as a demonstration of compliance with permit limits. On February 24, 1997, the U.S. EPA promulgated revisions to the following federal regulations: 40 CFR Part 51, Sec. 51.212; 40 CFR Part 52, Sec. 52.12; 40 CFR Part 52, Sec. 52.30; 40 CFR Part 60, Sec. 60.11 and 40 CFR Part 61, Sec. 61.12, that allow the use of credible evidence to establish compliance with applicable requirements. At the issuance of this permit, Kentucky has only

adopted the provisions of 40 CFR Part 60, Sec. 60.11 and 40 CFR Part 61, Sec. 61.12 into its air quality regulations.